Glenelg Shire Council

Casterton Aerodrome

Master Plan

February 2013

Executive summary

Glenelg Shire Council (GSC) has identified Casterton Aerodrome as an asset which is critical for the delivery of government services to the region. It has determined that to protect the aerodrome for continued use by organisations such the Victorian Air Ambulance (VAA) and the Department of Sustainability and Environment (DSE) current operations there is a need for an Airport Master Plan (Plan). This plan will also assist GSC in guiding the aerodrome's future development and ensuring zoning is compatible with the aerodrome's future use.

The Plan is intended to:

- Identify the airport site's existing conditions and development constraints; and
- Provide guidance for future development of the airport to cater for continued and increased government use.

The Plan was developed in consultation with GSC, key airport users and other interested parties.

The aerodrome complies with the standards required for CASR Part 121B operations, i.e., air transport operations in aircraft with a maximum take-off weight (MTOW) not exceeding 5,700 kilogram (kg).

The GSC does not monitor aircraft movements at Casterton. Current activity consists of:

- local and itinerate General Aviation (GA) used for private purposes, and
- fixed and rotary aircraft used for government business.

The Casterton Aerodrome is important to the operations of the Casterton Hospital and the Rural Ambulance Service. The Victorian Department of Sustainability and Environment (DSE) operates a base for fire fighting aircraft at the aerodrome at times of bush fire activity in the area.

The usability of any aerodrome is affected by prevailing weather conditions. Runway 16/34 has an 83% useability with 34 being the preferred runway. The usability with both runways is 97%.

16/34 Runway with a length of 1,100 m has sufficient length for the largest aircraft likely to use the aerodrome at MTOW; the Turbine Air Tractor - AT802. Runway 09/27 with a length of 519 m long is too short for use by a number of aircraft (Air Tractor, Cessna 404, Beech 200) at MTOW particularly with high ambient temperatures. For these aircraft at MTOW operations the aerodrome usability is capped at the runway 16/34 usability of 83%.

The plan assumes that the largest fixed wing aircraft likely to operate at Casterton is Air Tractor 802 with a wing span of 18.04 m, while the largest helicopter is the Erickson S-64F Air-Crane Helitanker with a rotor diameter of 22.0 m

The Plan provides apron capacity for a minimum of six (6) aircraft. Minimal car parking space is required for periods when the airbase is not operational. Parking for DSE vehicles can be up to 20 private vehicles and two trucks during a fire incident

GSC has determined that the aerodrome will be open for day time operations only. The spatial requirements used in the Plan are based on the physical characteristics set out in the MOS Chapter 13 and the ICAO Heliport Manual.

For day time only operations the runway strip width of 60 m can be retained. The existing runway and taxiway widths are also retained.

To provide an acceptable level of usability for the larger aircraft, runway 09/27 needs to be extended to match that of Runway 16/34 i.e. 1,100 m. The runway extension requires the GSC to acquire 5.4 ha of land

The Casterton Aerodrome is subject to the Glenelg Planning Scheme. Use of land for the Casterton Aerodrome is defined as an 'airport' as per Clause 74 of the Glenelg Planning Scheme. Further expansion of the aerodrome into the Farming Zone is prohibited. It is recommended that Council seek to rezone the existing Casterton Aerodrome site and the area proposed for its expansion to Special Use Zone. This would include creating a Schedule to the Special Use Zone that allows the use and development of the land as an aerodrome 'as of right'.

It is further recommended that in order to prevent development which may interfere with or cause a safety hazard to aircraft operations at Casterton Aerodrome, Council should consider applying a Design and Development Overlay (DDO) to the land subject to the proposed future Obstacle Limitation Surfaces (OLS). In addition, Council should consider applying the Airport Environs Overlay (AEO) to the land within the Casterton Aerodrome's 20 ANEF contour to prevent uses which may be sensitive to aircraft noise from encroaching upon the aerodrome.

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.2 and the assumptions and qualifications contained throughout the Report.

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1. Introduction

1.1 Master Plan Vision and Objectives

Glenelg Shire Council (GSC) has identified Casterton Aerodrome as an asset which is critical for the delivery of government services to the region. It has determined that to protect the aerodrome for continued use by organisations such the Victorian Air Ambulance (VAA) and the Department of Sustainability and Environment (DSE) current operations there is a need for an Airport Master Plan (Plan). This plan will also assist GSC in guiding the aerodrome's future development and ensuring zoning is compatible with the aerodrome's future use.

The GSC does not intend the aerodrome to cater for Regular Passenger Transport (RPT) services but is amenable to increased General Aviation (GA) traffic should this occur.

The Plan is intended to:

- Identify the airport site's existing conditions and development constraints; and
- Provide guidance for future development of the airport to cater for continued and increased government use.

The Plan was developed in consultation with GSC, key airport users and other interested parties.

The Plan will need to be reviewed regularly for applicability, and updated to reflect future developments and planning requirements. It is envisaged that the interval for review would be minimum of 5 years or when trigger points, such as the introduction of new legislation or when development opportunities occur.

1.2 Scope and Limitations

This report: has been prepared by GHD for Glenelg Shire Council and *may only be used and relied on by Glenelg Shire Council for the purpose agreed between GHD and the Glenelg Shire Council as set out in section 1.1 of this report.*

GHD otherwise disclaims responsibility to any person other than Glenelg Shire Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Glenelg Shire Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Casterton Aerodrome

2.1 Aerodrome Overview

The aerodrome complies with the standards required for CASR Part 121B operations, i.e., air transport operations in aircraft with a maximum take-off weight (MTOW) not exceeding 5,700 kilogram (kg).

The aerodrome's airside physical infrastructure includes one gravel and grassed runway, one gravel taxiway, one sealed aircraft parking apron, Buildings include one hangar and a DSE compound. The DSE compound includes an office building, water storage tanks and fuel storage for Jet A1.

The aerodrome has no runway lighting and so is only used during daylight hours.

It is currently used by:

- Victorian Government aircraft from the VAA and DSE; and
- General aviation (local and itinerate) aircraft.

2.2 Location

The airport is located approximately 4.5 kilometres (km) south west from the Casterton Town Centre. It is accessed via Springbank Road which connects to the Glenelg (Mt Gambier Casterton) Highway. **Figure 1** shows the relationship of the aerodrome to Casterton's town centre.

2.3 Aerodrome Description

The aerodrome is located in an area of undulating land. The apron is located on high ground approximately 5 metres (m) above the main runway end.

The airport is bounded grazing land to the east, south and west. Forest plantations are located east of the main runway's way northern end and on the east and west boundaries of the apron area.

The aerodrome site has a total area of 37.72 hectares (ha) and is at an elevation of 150.8 m (495 feet) Above Mean Sea Level (AMSL). **Figure 2** shows the existing aerodrome layout.

2.1 Land Tenure

The existing aerodrome buildings, hangar, apron, helipads and part of the north-south 16/34 runway are located on Crown Land reserved for public purposes (land area approximately 13.4 Ha).

The remainder of the 16/34 runway and the 09/27 runway are located within Council-owned land. This was purchased by Council in 1969.

Details of land tenure around the aerodrome are provided in **Figure 3**.

2.2 Access Roads and Car Park Areas

2.2.1 Access Roads

The vehicular access is from Springbank Road. The primary access is provided by a sealed 4 m wide road. A gravel access road is also provided to the DSE compound.

2.2.2 Car Park

The aerodrome has no designated car park. Vehicles park along the side of the access roads.

2.3 Utilities

2.3.1 Water

The aerodrome has no mains water supply.

2.3.2 Sewerage

The DSE compound is serviced by a septic tank.

2.3.3 Power

The aerodrome has no mains electric power supply. The nearest electric power supply is approximately 300 m away on the Glenelg Highway.

2.3.4 Telephone

The aerodrome has no fixed telephone connection.

2.4 Aircraft Movement Areas

2.4.1 Runway 16/34

Runway 16/34 is 1,100 m long and 18 m wide. It is classified as a Code 2 non-instrument runway. The runway has a gravel pavement which is estimated to be 350 - 600 mm deep. The pavement does not have a Pavement Classification Number (PCN) and is classified as unrated.

The runway is within a marked 1,220 m x 45 m wide graded runway strip.

The runway has no lighting. Visual aids include runway markers.

The runway operates under Visual Flight Rules (VFR).

2.4.2 Runway 09/27

Runway 09/27 is 519 m long and 18 m wide. It is classified as a Code 1 non-instrument runway. The pavement is grassed and is classified as unrated.

The runway has no lighting. Visual aids include runway markers.

The runway operates under VFR.

2.4.3 Declared Runway Distances

The declared distances for the 16/34 and 09/27 Runways are listed in **Table 1**. A recent obstacle survey [1]based on a 5% take off and approach grade has identified a number of obstacles (trees) in the approach and departure flight paths which reduce the usable length of the runways.

[1] Casterton Aerodrome Obstacle Limitation Survey, 20 June 2012, Airport Survey Consultants

Table 1 Declared Distances

Runway	Code	Take off Run Available (TORA) (m)	Take off Distance Available (TODA) (m)	Accelerate Stop Distance Available (ASDA) (m)	Landing Distance Available (LDA) (m)
16	2	1,100	1,160	1,100	1,100
34	2	1,100	1,160	1,100	1,100
09	1	519	579	519	519
27	1	519	579	519	519

Source: Airport Survey Consultants, 20 June 2012

2.5 Taxiway

There is one gravel taxiway leading from the 16 end of Runway 16/34 to the apron. It is approximately 18 m wide; equivalent to a Code C taxiway.

2.6 Apron

The primary apron has a sealed surface of approximately 870 square metres (m^2). Parking for DSE helicopters is provided within a fenced area located between the two access roads.

2.7 Operational Facilities

The aerodrome has no navigational aids.

There are two wind direction indicators located on the aerodrome; at the apron area and at the junction of the two runways. Neither is illuminated.

2.8 Security

Airside Security is provided by a 1.0 m high stock proof fence along the runways. There are two locked vehicular gates which provide access to the apron area and the DSE compound.

Pedestrian access to the apron area is via a gap in the fence located next to the vehicular gate.

The DSE compound is surrounded by a 1.8 m high wire mesh fence mounted with 3 strands of barbed wire. The DSE helicopter landing area located along the access roads is also bounded by a stock proof fence.

2.9 Building Area

2.9.1 Apron Areas

The only building in the apron area is a hanger, which is privately owned on land leased from Council.

2.9.2 DSE Compound

The DSE compound houses the following facilities:

- a two storey aerial fire operations building (112.5 m^2);
- four water storage tanks (113,000 litres (l)) and a pump shed;
- fuel storage - Jet A1 storage tank and drums; and

- a storage shed.

2.10 Airspace

Casterton aerodrome operates as an un-controlled aerodrome as there is no Air Traffic Control (ATC) presence.

Uncontrolled airspace is classified as Class G airspace. Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) operations are permitted and do not require an airways clearance.

Pilots are expected to make positional broadcasts using a Common Traffic Advisory Frequency (CTAF) assigned for the purpose. All flying at Casterton is conducted in accordance with the VFR, which requires pilots to navigate by reference to prominent features of the landscape and the built environment, and to assume responsibility for their separation from other aircraft.

3. Aviation Activity

3.1 Current Activity

The GSC does not monitor aircraft movements at Casterton. Current activity consists of:

- local and itinerate General Aviation (GA) used for private purposes, and
- fixed and rotary aircraft used for government business.

3.1.1 General Aviation

There is one amateur built light aircraft based at the aerodrome. It is stored in the hangar. There is no record concerning historic and current GA activity at the aerodrome. Anecdotal information supplied by a GSC staff member indicates that the aerodrome is only occasionally used by itinerate aircraft. Usage by itinerate aircraft is discouraged by the fact that the aerodrome has no lights, navigational aids or fuel facilities.

3.1.2 Victorian Air Ambulance

The Casterton Aerodrome is important to the operations of the Casterton Hospital and the Rural Ambulance Service. VAA operates four customised King Air B-200 planes with the engineering and piloting outsourced to Pel-Air. The physical characteristics of the B-200 are included in Appendix A.

Air ambulance operations at the aerodrome since 2004/05 have averaged 58 movements per year (a transfer every 12 days) with a peak of 74 movements in 2008/09. An estimated 15% of air ambulance [2]transfers occur at night and so do not occur at the aerodrome because there is no runway lighting.

3.1.3 Department of Sustainability and Environment

The Victorian Department of Sustainability and Environment (DSE) operates a base for fire fighting aircraft at the aerodrome at times of bush fire activity in the area. This is one of a statewide network of fire-bombing bases.

The DSE presence:

- Generates large volumes of vehicular traffic;
- Generates “Heavy” movement of aircraft; and

[2] Casterton Airfield Improvements options Lindsay Merritt, GSC Group Manager Assets and Infrastructure

- Requires the storage of:
  - equipment;
  - aviation fuel; and
  - retardant and water.

Activities carried out at the base include:

- Aircraft maintenance;
- Hot refuelling; and
- Loading of water and retardants.

Aircraft which may be used by the DSE include those shown in **Table 2**. The standards for individual aerodrome facilities, which are suitable for use by fixed wing aircraft within a range of performances and sizes, is determined by the aircraft's Aerodrome Reference Code (ARC). A description of the ARC is provided in **Error! Reference source not found.**.

Table 2 DSE Aircraft Types

Fixed Wing		Helicopter		
Observation and spotting	Bombers	Light	Medium	Heavy
Piper Warrior Cessna 182 Cessna 210 Cessna 310 Piper Seneca Cessna 404 – Titan	Turbine Air Tractor - AT802 (PZL M18 Dromader	Bell 206B Jetranger AS350 Aerospatiale Squirrel	Bell 205 Bell 212 Bell 412	Air-Crane Helitanker (Erickson S-64F)

A brief description of the fixed wind bombers and heavy helicopter is included in Appendix B. The remainder of the aircraft used by DSE are common GA aircraft.

Data for aerial fire operations obtained from DSE for the period 2004/05 to 2008/9 indicated that the number of days these operations were carried out averaged 10 days per year with a peak of 17 days. Estimated flying activity for each aircraft type on a given operational day during these periods is included in **Table 3**. This suggests that during any particular fire operations incident there could be as many as 120 movements per day.

Table 3 DSE Aircraft Daily Movements

	Fixed wing observation and spotting	Fixed wing air tankers	Light helicopters	Medium and Heavy helicopters
Number of aircraft	3	3 - 4	3	3
Movement (arrivals /departures)	30	30-40	30	30

3.2 Future Activity

3.2.1 RPT Services

Casterton is centrally located between Hamilton (61 km), Mt Gambier (71 km) and Portland (98 km), all of which have Regular Passenger Transport (RPT). As a consequence RPT services are not expected to be provided to Casterton.

3.2.2 General Aviation

The volume of GA activity is unlikely to increase from its current number. With no significant increase in aerodrome infrastructure planned by GSC, for planning purposes two movements per week (104 per year) has been assumed.

3.2.3 Victorian Air Ambulance

There is no significant increase in regional population forecast (a primary driver for ambulance demand) and as a consequence the number of future air ambulance movements is expected to be similar to those of recent years. For planning purposes, however, an increase in VAA movements to two movements per week (104 per year) has also been assumed.

3.2.4 Department of Sustainability and Environment

The nature of this activity is such that no definite forecast of aircraft movements can be made.

The fire season (when most of the aircraft activity occurs) can commence in early November and carry on through to late February and early March. In addition to this activity aircraft also are used for fuel reduction. This primarily occurs in winter, but depending on weather conditions can still be carried out in spring.

At Casterton this means that DSE aerial activity can occur all year round, with a peak expected in the summer months.

For planning purposes 3,000 aircraft movements per year have been assumed; 2040 movements during the fire season based on 17 days of operations.

4. Constraints

4.1 General

There are a number of physical, operational and legislative constraints, which impact on how the Casterton Aerodrome can be developed to provide facilities which meet the future demand.

4.2 Casterton Town Planning Scheme

The Casterton Aerodrome is subject to the Glenelg Planning Scheme.

Use of land for the Casterton Aerodrome is defined as an ‘airport’ as per Clause 74 of the Glenelg Planning Scheme.

4.2.1 Local Planning Policy

Clause 22.04.5 (Transport) of the Glenelg Planning Scheme highlights the Casterton Aerodrome as a key transport link within the Glenelg Shire.

The objective of this Clause is ‘*To ensure that future planning reinforces the function and utility of the transport infrastructure*’. It is considered that the proposed expansion of the Casterton Aerodrome would reinforce its current key operations for the air ambulance service and for fire fighting aircraft.

4.2.2 Farming Zone

The existing aerodrome land and the land proposed to be used for expansion of the aerodrome are within the Farming Zone. In 2007, use of land as an airport become a Section 3 (prohibited) use within the Farming Zone.

4.2.3 Environmental Significance Overlay Schedule 3 - Red-Tailed Black Cockatoo Habitat Areas (ESO3)

The existing aerodrome land and the land proposed to be used for expansion of the aerodrome are within the Environmental Significance Overlay Schedule 3 (ESO3). The environmental objective to be achieved by the ESO3 is '*To protect areas of critical breeding habitat of the endangered Red-tailed Black Cockatoo by ensuring the retention of suitable nesting trees within the bird's known nesting area*.'

A permit is required for the removal of hollow dead River Red Gum trees having a diameter greater than 60 cm at 1 metre above ground level.

4.2.4 Bushfire Management Overlay (BMO)

The purpose of the Bushfire Management Overlay (BMO) is:

- To assist to strengthen community resilience to bushfire;
- To identify areas where the bushfire hazard requires specified bushfire protection measures for subdivision and buildings and works to be implemented;
- To ensure that the location, design and construction of development considers the need to implement bushfire protection measures; and
- To ensure development does not proceed unless the risk to life and property from bushfire can be reduced to an acceptable level.

The bushfire risk to the Casterton Aerodrome is heightened by its close proximity to pine forest plantations in the north and directly adjacent to the site on both the eastern and western sides. However, it is noted that a key function of the aerodrome is as a fire bombing base for fire-fighting aircraft, and therefore the expansion of the aerodrome is considered to assist in reducing risks to persons and property during bushfire within the surrounding area.

The provisions of this overlay do not apply to works associated with the extension of the airfield.

4.2.5 Strategic Documents

The Glenelg Sustainable Settlement Strategy (the Strategy) was approved for release on 26 June 2012. The Strategy is intended to act as a roadmap for strategic planning across Glenelg Shire for the next 25 years.

The Strategy acknowledges the importance of the Casterton aerodrome in providing for emergency access during major bushfires or flood events.

In addition, the Strategy notes that low density residential development is planned to the west of the Casterton township (within the area subject to the Development Plan Overlay Schedule 3), north-east of the Casterton Aerodrome.

Development heights on and around the aerodrome are controlled by the aerodrome Obstacle Limitation Surfaces (OLS). The existing aerodrome OLS is shown in **Figure 4**.

4.3 Wind Direction

The useability of any aerodrome is affected by prevailing weather conditions. The biggest constraint to useability is related to wind direction, critically cross-winds.

An aircraft's susceptibility to cross winds is determined by its size; the larger the aircraft the greater its cross-wind tolerance. For planning purposes the limiting cross-wind component recommended for use as per the International Civil Aviation Organisation (ICAO) Annex 14 is:

- − 20 kt (37 kph) for aircraft whose reference field length is 1500 m or over,

- − 13 kt (24 kph) for aircraft whose reference field length is 1200 m or up to 1500 m; and
- − 10 kt (19 kph) - for aircraft whose reference field length is less than 1200 m.

Where runways are provided essentially for light aircraft operations with ab-initio flying the design cross wind component should be 10 kt.

Runway useability charts based on Bureau of Meteorology (BOM) wind data for Casterton Aerodrome for daylight hours are shown in **Figures 5 and 6**.

Figure 5 shows that the 16/34 Runway orientation is close to the optimum and has 83% useability with 34 being the preferred runway. GSC staff estimate that 90% of the movements on Runway 16/34 are in the 34 direction.

Figure 6 shows that the cross Runway 09/27 is also close to optimal alignment and provides an overall useability of 97% when used in combination with Runway 16/34.

4.4 Runway Length

The required take -off distances for aircraft which regularly operate from Casterton are included in **Appendix B**.

16/34 Runway with a length of 1,100 m has sufficient length for the largest aircraft likely to use the aerodrome at MTOW; the Turbine Air Tractor - AT802, which requires a take-off runway length of between 800 m and 1200 m. Runway 16/34 has sufficient length for the smaller aircraft to start their take off runway near the intersection of the cross runway.

Runway 09/27 with a length of 519 m long is too short for use by a number of aircraft (Air Tractor, Cessna 404, Beech 200) at MTOW particularly with high ambient temperatures. For these aircraft at MTOW operations the aerodrome usability is capped at the runway 16/34 usability of 83%.

5. Demand

5.1 Overview

The number and dimensions of future aircraft demand will determine the dimensions of airside facilities that need to be provided at Casterton aerodrome. The extent of landside facilities required is primarily based on the DSE resourcing estimates required when the fire base is operational.

5.2 Design Aircraft

The plan assumes that the largest fixed wing aircraft likely to operate at Casterton is Air Tractor 802 with a wing span of 18.04 m, while the largest helicopter is the Erickson S-64F Air-Crane Helitanker with a rotor diameter of 22.0 m.

5.3 Apron

DSE has estimated a peak aircraft apron parking demand of five fixed wing and three rotary winged aircraft. The five fixed wing aircraft would occupy the apron area while the rotary wing aircraft would occupy an area between the access roads, which is designated for helicopter operations.

With the likelihood that a VAA may also need to be accommodated, apron capacity for a minimum of six (6) aircraft needs to be provided.

5.4 Car Park

The Minimal car parking space is required for periods when the airbase is not operational. Parking for DSE vehicles can be up to 20 private vehicles and two trucks during a fire incident.

6. Aircraft Planning Considerations

6.1 Planning Standards

The planning standards which are applied to the aerodrome will determine the size of the aerodrome footprint and infrastructure that needs to be provided. There are two standards each applicable to fixed wing and helicopter operations at Casterton as outlined below.

6.1.1 Fixed wing aircraft operations

CAAP 92 (1) Guidelines for Aeroplane Landing Areas

These guidelines set out factors that may be used to determine the suitability of a place for the landing and taking-off of aeroplanes. It notes that the use of landing areas other than aerodromes is not recommended for aircraft with a MTOW greater than 5,700 kg.

The aeroplanes engaged in the following operations may use a landing area:

- private;
- aerial work—excluding student solo flying and student dual flying prior to successful completion of the General Flying Progress Test; and
- charter.

The information in this publication is advisory only, in that there is no legal requirement to observe the details set out in this publication.

It is noted a number of aircraft operated by the DSE have MTOWs in excess of 5,700 kg. The responsibility to ensure that these aircraft operate safely at Casterton rests with the holder of the Air Operator Certificate (AOC).

Manual of Standards (MOS) - Part 139 Aerodromes

The MOS is made pursuant to Civil Aviation Safety Regulations (CASR) Part 139. CASR Part 139 sets out the regulatory regime of aerodromes used by aeroplanes conducting air transport operations under CASR Part 121A and Part 121B. These include certified, registered aerodromes and other aerodromes used.

Chapter 13 sets out the minimum standards for aerodromes by aeroplanes with a MTOW not exceeding 5,700 kg.

6.1.2 Helicopters

CAAP 92-2 (1) Guidelines for the establishment and use of Helicopter Landing Sites (HLS)

There are two types of HLS: a basic and a standard. The former can only be used for day operations while the latter can be used for both day and night operations.

A basic HLS has minimal planning requirements. These are:

- It should be large enough to accommodate the helicopter safely;

- It should have a surface capable of withstanding the static and dynamic loads imposed by the helicopter; and
- It should only be used for day operations under helicopter Visual Meteorological Conditions (VMC).

A basic helipad that the operations will be limited to infrequent, opportunity and short term operations. Given the rate of effort required during a severe fire season such a definition may not be considered to be appropriate for Casterton.

A standard helipad has a defined Final Approach and Take Off (FATO) area and a approach and departure path. The information in this publication is advisory only, in that there is no legal requirement to observe the details set out in this publication.

ICAO Heliport Manual

This document provides specifications for the planning and design for three types of helipad: surface level, elevated and helidecks located off shore. It describes requirements in relation to three helicopter performance classes.

6.2 Applicability of Standards

The physical characteristics which are applicable to Casterton from the standards above are shown in **Appendix B**.

For day time operations of fixed wing aircraft, both the MOS and CAAP 92(1) apply identical runway characteristics. The MOS standards however, produce a larger OLS than those in the CAAP, and consequently have a potentially larger impact on land adjoining the aerodrome.

While with its current level of activity Casterton aerodrome could be considered to be operating as an aeroplane landing area (and so come under the requirements of the CAAP) to provide better security for the aerodrome future operation this plan will be based on the physical characteristics set out in the MOS Chapter 13.

For day time operations by helicopters both standards provide for similar helipad dimensions. The ICAO standards produce a larger OLS than those in the CAAP and consequently have a larger potential impact on land adjoining the aerodrome. To provide greater protection of the helicopter approaches this plan are based on the physical characteristics set out in the Heliport Manual.

6.2.1 Obstacle Limitation Surfaces

The future OLS based on the proposed runway layout is shown in **Figure 9**.

6.2.2 Aircraft Noise

An ANEF based on the forecast aircraft is included in **Figure 10.** This is an indicative chart due to lack of information concerning aircraft movements and specific helicopter noise data available in the Integrated Noise Model, which necessitated the use of generic aircraft in the noise modelling process.

Australian Standard AS 2021-2000, “Acoustics – Aircraft noise intrusion – Building siting and construction” requires that land use planning around Australian civilian airports and military airfields be based on an ANEF.

The contours show increasing aircraft noise exposure from 20 ANEF to 40 ANEF. These ANEF contour numbers are not related to any value of the single event noise parameters and cannot be directly measured. Within the 20 ANEF contour the building types and construction is regulated.

7. Infrastructure Requirements

7.1 Runway Strips

For day time only operations the MOS specifies a minimum runway strip width of 60 m.

7.2 Runways

The MOS defines the useability of an aerodrome as the percentage of time during which the use of a runway or system of runways is not restricted because of cross-wind component.

While CASA does not currently specify a minimum aerodrome useability level, in Australia it has been historic practice to aim for 99.8% useability for capital city aerodromes and 99.5% for other aerodromes. ICAO recommends that the number and orientation of runways at an aerodrome shall be such that the useability of the aerodrome is not less than 95 per cent for the aircraft that the aerodrome is intended to serve.

To provide this level of usability for the larger aircraft, runway 09/27 needs to be extended to match that of runway 16/34 i.e. 1,100 m. The existing 16/34 Runway length will be retained.

The current runways widths exceed the 15 m requirements of the MOS for day time operations.

7.3 Fixed Wing Aprons

While the operation of the aircraft on the apron is the responsibility of the Air Operator's Certificate (AOC) owner, the layout of the apron precinct has been planned to the requirements of the MOS to accommodate six (6) free moving aircraft.

7.4 Helicopter Aprons

The helipads have been planned to accommodate the range of helicopters likely to operate from Casterton. The helipad area which consists of a FATO included in a safety area is sized to accommodate the largest helicopter using the helipad, The Safety Area dimensions are given in **Table 4**.

Table 4 Safety Area Diameter

Aircraft Model	Safety Area Diameter (m)
Bell 206B Jetranger	30.5
AS350 Aerospatiale Squirrel	
Bell 205	
Bell 212	
Bell 412	
Air-Crane Helitanker (Erickson S-64F)	47.8

8. Master Plan Outcomes

8.1 General

Figures 7 and 8 show the Master Plan layout for Casterton Aerodrome, which will enable it to cater for future operations. The Plan provides indicative sizes and locations for the future facilities to meet the requirements of the MOS and ICAO Heliport Manual and accommodate the peak demand number of helicopters and fixed wing aircraft.

8.2 Runways

The Plan re-uses the existing 09/27 Runway alignment and proposes the extension to the west of runway 09/27 to an overall length of 1,100 m. The runway extension requires the GSC to acquire approximately 5.4 ha of land (refer **Figure 3**)

8.3 Aprons

Aprons have been planned to accommodate the peak demand of six fixed wing aircraft parking during a fire incident. Dedicated apron parking has been included for the Air Ambulance.

Three FATOs have been provided. One of these is planned to accommodate the Helitanker.

The fixed wing aircraft and helicopter parking are located separately.

8.4 Car Parks

Public parking has been provided on the access roadway adjacent to the main airside entry. A DSE car park area leading from the DSE compound access road has been located adjacent to the DSE compound.

8.5 Proposed Land Use Guidelines

As discussed in Section 4.2.2, the Casterton Aerodrome site is currently located within the Farming Zone, under which use of land as an airport is prohibited. It is therefore recommended that Council seek to rezone the existing Casterton Aerodrome site and the area proposed for its expansion. This is discussed further in Section 8.5.3.

A proposal to rezone the existing Casterton Aerodrome site and the area proposed for its expansion will require a strategic approached planning. Proposed strategic land use planning objectives for the Casterton Aerodrome are outlined below.

8.5.1 Proposed Strategic Objectives

The proposed objectives of land use planning for the Casterton Aerodrome are:

- to support the use of the Aerodrome by the Casterton Hospital, the Victorian Air Ambulance and DSE;
- to maintain the safety and efficiency of the Aerodrome; and
- to ensure that all development in the vicinity of the Aerodrome is compatible with its present and future operations as detailed in this Master Plan, particularly in relation to the impacts of aircraft noise and the contour height shown in the Obstacle Limitation Surfaces Plan (**Figure 4**).

8.5.2 Land Ownership Considerations

As detailed in Section 2.1, the existing Casterton Aerodrome is partly located on reserved Crown Land and partly located within Council-owned land.

Expansion of the 09/27 runway to the west (to a total length of 1100 m) would necessitate the acquisition by Council of approximately 5.4 Ha of privately-held land (3.5 Ha and 1.9 Ha held by two different owners).

Consultation with DSE would be required prior to works being undertaken on the Crown Land in the north of the site. The Victorian *Crown Land (Reserves) Act 1978* requires the issue of a licence from DSE for carrying out works on reserved Crown land.

8.5.3 Proposed Planning Controls

Zoning

Existing use rights apply to the Casterton Aerodrome, as per Clause 63 of the Glenelg Planning Scheme, as the land has been in continuous use as an aerodrome for the last 15 years.

However, further expansion of the aerodrome into the Farming Zone is prohibited.

It is therefore recommended that Council seek to rezone the existing Casterton Aerodrome site and the area proposed for its expansion to Special Use Zone. This would include creating a Schedule to the Special Use Zone that allows the existing and future use and development of the land as an aerodrome 'as of right'.

Overlays

In addition to rezoning as outlined above in Section 8.5.3, it is recommended that Council seek to apply the following overlays:

Airport Environs Overlay (AEO)

In order to prevent uses which may be sensitive to aircraft noise from encroaching upon the aerodrome, Council should consider applying the Airport Environs Overlay (AEO) to the land within the Casterton Aerodrome's 20 ANEF contour, as shown in **Figure 11**.

This would involve the addition of a Schedule to the AEO that would trigger a planning permit for sensitive land uses, including:

- Accommodation (including dwellings and residential buildings).
- Art and craft centre.
- Child care centre.
- Display home.
- Education centre.
- Hospital.
- Hotel.
- Office.
- Place of assembly.
- Research and development centre.
- Research centre.
- Restricted recreation facility.

- Tavern.

Furthermore, application of an AEO to the land shown in **Figure 11** would require that any new buildings must be constructed in compliance with noise attenuation measures required by Section 3 of Australian Standard AS 2021-2000, Acoustics - Aircraft Noise Intrusion - Building Siting and Construction.

Design and Development Overlay (DDO)

In order to prevent development which may interfere with or cause a safety hazard to aircraft operations at Casterton Aerodrome, Council should consider applying the Design and Development Overlay (DDO) to the land subject to the proposed future Obstacle Limitation Surfaces (OLS) as per **Figure 11**.

This would involve creating a Schedule to the DDO that requires a planning permit to construct a building or carry out works (including landscaping) that would exceed in height the contours on the OLS shown on **Figure 11**.

It is further recommended that a planning permit application triggered by the Schedule to the DDO should be referred to the Civil Aviation Safety Authority (CASA).

8.5.4 Proposed Land Use Guidelines by Precinct

Land use recommendations for each precinct of the Casterton Aerodrome are outlined below.

Helicopter Precinct

- Helipads (incorporates helicopter maintenance area).

The Airport Environs Overlay (AEO) would apply to this precinct.

The Design and Development Overlay (DDO) would apply to this precinct.

Fixed Wing Aircraft Precinct

- Fixed wing aircraft storage (apron capacity for a minimum of six aircraft)
- Taxiway
- DSE (and VAA, if required) operations office and car park
- Aircraft maintenance area (i.e. hangar)
- Separate storage areas or facilities including:
  - Aviation fuel storage
  - Water tanks
  - Fire retardant tanks
  - Maintenance equipment shed
- Car parking (provision for up to 20 private vehicles and two trucks during a fire incident)

The Airport Environs Overlay (AEO) would apply to this precinct.

The Design and Development Overlay (DDO) would apply to this precinct.

Runways Precinct

- 09/27 unsealed marked runway strip
- 16/34 sealed marked runway strip
- Visual aids associated with runway operations (e.g. runway markers, runway strip boundary cones, airfield lighting, windsock etc.)

The Airport Environs Overlay (AEO) would apply to part of this precinct.

The Design and Development Overlay (DDO) would apply to this precinct.

It is expected that periodic maintenance of vegetation would also be required in all Precincts to maintain safe aircraft operations and to ensure integrity of the OLS.

Landside Precinct

- Airport development and uses within this precinct must be compatible with safe aerodrome operation and comply with the requirements of the Airport Environs Overlay (AEO) and Design and Development Overlay (DDO).

8.6 Implementation Plan

- Seek to rezone the existing Casterton Aerodrome site and the area proposed for its expansion to Special Use Zone (SUZ), as shown in **Figure 11**.
- Seek to apply the Airport Environs Overlay (AEO) to the land within the Casterton Aerodrome's 20 ANEF contour, as shown in **Figure 11**.
- Seek to apply the Design and Development Overlay (DDO) to the land subject to the proposed future Obstacle Limitation Surfaces (OLS) as per **Figure 11**.
- The main driver for the development of the airport is the operational needs of DSE and the VAA and as such the implementation of this Plan does not have a fixed time frame associated with it.

Appendices

Appendix A - Aircraft Characteristics

Fixed Wing Aircraft

King Air B-200

VAA operates four customised King Air B-200 planes with the engineering and piloting outsourced to Pel-Air

- Wing span 16.6 m
- Length 13.3 m
- MTOW 5,670 kg
- Take-off run 592 m (Source MOS)
- Engine 2 X Piston

PZL M18 Dromader

DSE has five M18 Dromaders. They carry a payload of 2,500 litres (l) of fire retardant.

- Wing span 17.70 m
- Length 9.47 m
- MTOW 4,200 kg
- Take-off run 190 m

PZL M18 Dromader

Source http://www.pzlmielec.pl/en/offer/products/m18-dromader/basic-data/

Air Tractor 802

The AT802 carries 3,200 l of fire retardant or foam solution.

- Wing Span 18,04 m
- Length 10.97 m
- MTOW 7,257 kg
- Landing Weight 7,257 kg

Air Tractor 802

Source http://www.airtractor.com/node/43

Cessna 182

- Wing span 8.84 m
- Length 11 m
- MTOW 1,411 kg
- Take-off Run 310 m
- Engine 1 X Piston

Cessna 210

- Wing span 11.2 m
- Length 8.59 m
- MTOW 1,315 kg
- Take-off Run 345 m
- Engine 1 X Piston

Cessna 310

- Wing span 8.23 m
- Length 10.67 m
- MTOW 2,576 kg
- Take-off Run 523 m
- Engine 2 X Piston

Cessna 404

- Wing span 14.1m
- Length 10.1 m

- MTOW 2,252 kg
- Take-off Run 721 m
- Engine 2 X Piston

Piper 28

- Wing span 10.67 m
- Length 7.25 m
- MTOW 1,054 kg
- Take-off Run 536 m
- Engine 1 X Piston

Piper 34

- Wing span 11.8 m
- Length 8.7 m
- MTOW 1,905 kg
- Take-off Run 432 m
- Engine 2 X Piston

Helicopters

Light Helicopters

The DSE light helicopter fleet comprises squirrel and the Jetranger helicopters.

The Aerospatiale Squirrel (AS350) is a turbine-powered helicopter capable of carrying five passengers. The Bell Jetranger 206B III is a turbine-powered helicopter capable of carrying 6 passengers.

Aerospatiale Squirrel (AS350)

- Length 10.93 m
- Rotor Diameter 10.69 m
- MTOW 2,250 kg
- Engine 1 X Turbo

Bell Jetranger 206B III

- Length 12.1 m
- Rotor Diameter 10.160 m
- MTOW 1,451 kg
- Engine 1 X Turbo

Medium Helicopters

DSE operates up to five medium class helicopters (such as the Bell 205, Bell 212 or Bell 412) for aerial firefighting.

Bell 205

- Length 17.41 m
- Rotor Diameter 14.61 m
- MTOW 2,150 kg
- Engine 1 X Turbo

Bell 212

- Length 17.46 m
- Rotor Diameter 14.69 m
- MTOW 5,080 kg
- Engine 2 X Turbo

Bell 412

- Length 17.07 m
- Rotor Diameter 14.02 m
- MTOW 5,397 kg
- Engine 2 X Turbo

Heavy Helicopters

Erickson S-64F

The Erickson S-64F Air Crane Helitanker is a heavy lifting helicopter with a 9000 l capacity fixed tank attached to the under body of the helicopter's fuselage.

http://www.ericksonaircrane.com/full_story/fullstory_firefighting.

- Length 27.3 m

- Height 7.82 m
- Main rotor diameter 22.0 m

When the Air-crane is dispatched to a wildfire it is supported by essential ground resources, a fully pressurized refueling truck containing 30,000 l of Jet-A1, a mobile foam support unit and an engineering maintenance team.

Appendix B - Standards

Comparison CAAP 92 (1) and MOS

	CAAP			MOS		
	Non-agriculture (Day)		Non-agriculture (Night)	<5700kg (Night)	<5700kg (Day)	<2000kg (Day)
	<2000kg	>2000kg				
Runway						
Width (m)	10	15	15	18	15	10
Length (m)	≥ specified in flight manual					
Overall Slope	<2%			2%		
Transverse Slope	<2.5% (or <12.5% on upward slope over fly-over area)			<2.5% Runway <3% Runway Strip		
Strip Width graded	30	45	45	45	45	
Strip Width including Fly over (m)	60	60	90	80	60	60
OLS approach and take-off						
Length inner edge	60	60	90	80	60	30
Distance of inner edge before threshold (m)				60	30	30
Divergence	5%	5%	5%	10%	10%	10%
Length (m)	900		900	2500	1600	900
Slope	Clear of objects over 5%		Clear of objects over 3.3%	4%	5%	5%
OLS transition						
Slope Transitional surface (to 45 m height)				20%	20%	20%
OLS Inner horizontal						
Height (m)				45	45	45
Radius from runway strip (m)				2,500	2,000	2,000

For day time operations of aircraft with a MTOW of > 2000 kg the runway characteristics specified in the CAAP and MOS are identical.

Comparison CAAP 92-2 (1) and ICAO Heliport Manual

	ICAO Heliport Manual		CAAP
FATO	1.5 x the greater of over all of the length/width		2 x length of the helicopter, when the rotor(s) are turning for the largest aircraft using the helipad
Safety Area	the greater of 3 m or 0.25 times the greater of over all of the length/width		
OLS - Non Instrument	**Approach surface**	**Departure Surface**	
Width Of Inner Edge	safety area	safety area	FATO
1st Section			
Divergence	10%	7 x rotor diameter	10%
Length	245	Required to achieve 7 x rotor diameter	At height of 500 feet above the helipad level
Outer Width	49	7 x rotor diameter	4 x the rotor diameter for the largest aircraft
Slope	8%	4.5%	7.5°
2nd Section			
Divergence	10%	parallel	
Length	Required to achieve 7 x rotor diameter	At height 150 m above inner edge	
Outer Width	7 x rotor diameter		
3rd Section			
Length	At height 150 m above inner edge		
Outer Width	7 x rotor diameter		
Slope	15%		

The OLS is provided for a helicopter with a category 1 performance. It assumes a straight take off.

Appendix C - Acronyms and Glossary

ANEF Australian Nosier Exposure Forecast - These ANEF contour numbers are not related to any value of the single event noise parameters and cannot be directly measured. The ANEF is produced using the USA's Federal Aviation Administration's Integrated Noise Model which calculates the future noise exposure over a 24 hour period based on the averaged aircraft movements over the annual operational period of the aerodrome, i.e. the total number of aircraft movements divided by the number of operational days in a year.

AOC Air Operator's Certificate

ARC Aerodrome Reference Code - composed of two elements: element 1 is a number related to the aeroplane reference field length; and element 2 is a letter related to the aeroplane wingspan and outer main gear wheel span.

Code element 1		Code element 2		
Code number	**Aeroplane reference field length**	**Code letter**	**Wing span**	**Outer main gear wheel span**
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m

Air Transport Operation An operation in an aircraft:

- That is conducted for hire or reward or is otherwise publically available and
- That is a passenger transport operation or a cargo transport operation.

Airspace Class G uncontrolled airspace

AMSL Above Mean Sea Level

ARFL Aircraft Reference Field length – The minimum field length required for take-off at maximum certificated take-off mass, *sea level, standard atmospheric conditions, still air and zero runway slope*, as shown in the appropriate aeroplane flight manual prescribed by the certificating authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.

ART Airport Reference Temperature - the mean of the daily maximum temperatures for the hottest month of a year

ATC Air Traffic Control

Basic HLS A place that may be used as an aerodrome for infrequent, opportunity and short term basis for all types of operations, other than RPT, by day under helicopter VMC

BMO Bushfire Management Overlay

BOM Bureau of Meteorology

CAAP Civil Aviation Advisory Publication

CASA Civil Aviation Safety Authority

CASR Civil Aviation Safety Regulations

CTAF	Common Traffic Advisory Frequency
DSE	Department of Sustainability and Environment
ESO3	Environmental Significance Overlay Schedule 3
FATO	Final approach and Take off area
Ft	Feet
GA	General Aviation
GHD	GHD Pty Ltd
GSC	Glenelg Shire Council
Ha	Hectares
HLS	Helicopter Landing Site - a place that may be used as an aerodrome for the purposes of landing or taking off of helicopters.
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
ISA	International Standard Atmosphere
Km	kilometres
Kt	knot
LDA	Landing Distance Available
m	metre
m^2	square metre
Mhz	Megahertz
MOS	CASA Manual of Standards Part 139
MTOW	Maximum Take-off Weight
nm	nautical miles
Non-instrument runway	a runway intended for the operation of aircraft using visual approach procedures
OLS	obstacle limitation surface
PCN	Pavement Classification Number - A number expressing the bearing strength of a pavement for unrestricted operations by aircraft with Aircraft Classification Number (ACN) value less than or equal to the PCN. The ACN is number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category
RPT	Regular Passenger Transport
Standard HLS	A place that may be used as an aerodrome for helicopter operations by day or night
TODA	Take-off Distance Available
TORA	Take-off Run Available
VAA	Victorian Air Ambulance
VFR	Visual Flight Rules
VMC	Visual Meteorological conditions

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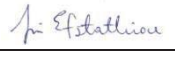
Final 0	R. Vandenbroucke / R. Straits	J. Efstathiou		J. Efstathiou		12/02/13

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